

## PATENT

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## REMARKS

Reconsideration of the application is respectfully requested. Claims 10-12, 14-15, 17-22 were rejected under Section 103 as being obvious over WO 97/15715 or WO 98/23810 in view of Kirschner (5,460,696). This rejection is respectfully traversed.

In summary, the present invention is an effective system for oxygen delignification where the delignification is performed in two stages. The system requires the oxygen delignification taking place in at least two stages and where the system, among other things, requires steam supply to a mixer downstream of the first delignification zone followed by a downstream pump and mixer. The two stage of the present invention provides for substantially improved selectivity.

WO 97/15715 or WO 98/23810 merely shows a first pump 1, a first mixer 2 and a first delignification zone 3, a second pump 4, a second mixer 5 and a second delignification zone 6 so that the second pump 4 is directly connected to the first delignification zone 3. Steam and some oxygen are added to the second mixer 5.

WO 97/15715 or WO 98/23810 completely fails to teach or suggest a second mixer in fluid communication with and disposed immediately downstream of the first delignification zone. The references also fail to teach a steam supply in fluid communication with and attached to the second mixer. Furthermore, the second pump 4 is upstream (not downstream) of the second mixer 5.

In contrast, WO 97/15715 or WO 98/23810 shows the second pump being immediately downstream of the first delignification zone and the steam supply is attached to the mixer 5 that is downstream (not upstream) of the pump 4.

Applicant fails to see why a person of ordinary skill in the art would look to the cited WO references to learn about

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these features when the mixer and its steam supply are completely missing.

Kirschner does not cure the above deficiencies. Kirschner merely shows a first mixer 16 with a steam supply 18 and a downstream first pump 20 followed by a second mixer 22 that is upstream of the first delignification zone 28. A caustic soda supply is connected to the mixer 22. Only a single mixer 24 is disposed downstream of the first delignification zone 28 and upstream of the second delignification zone 30. One important objective of Kirschner's invention is to reduce the peak alkali that is initially charged. This is why Kirschner has split up the process with three reactors. There is no teaching or need for adding the combination of pump, mixers and steam supply downstream of the first reactor as required by amended claim 1.

The objective in Kirschner is to reduce peak alkali charge initially (which is damaging the pulp quality) where alkali is split into three charges in-between three oxygen reactors. The only purpose of splitting the single reactor into three reactors is to avoid the peak alkali charge that otherwise is added initially. If a skilled person would to modify the Kirschner patent with the split heating principles of -715 and -810, three options may be available including:

- A) Simply adding steam mixers between reactors in Kirschner (using the well proven technology to use one single pump ahead of all reactors as is done in Kirschner);
- B) Reducing pump pressure in pump 20, and adding a sequence of pump+steam mixer in-between of reactors such that a pump+steam mixer+alkali mixer combination is obtained; or
- C) Making the mixing in one and the same mixer after a pump.

There is no need to add a new pump in Kirschner if the pulp flow is steady and if the mixers introduce too much pressure drop the approach of -715 and -810 would be done.

Kirschner merely teaches attaching a steam supply to a mixer and this mixer is upstream of the first delignification

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zone. However, Kirschner does not teach or suggest a second mixer, having a steam supply attached thereto, so that the second mixer is in fluid communication with and disposed immediately downstream of the first delignification zone. In other words, Kirschner fails, among other things, to teach or suggest: 1) a second mixer and a steam supply attached thereto that are downstream of the first delignification zone (reactor 28), a second pump downstream of the second mixer and 3) a third mixer downstream of the second pump. Kirschner merely teaches supplying steam to a mixer that is upstream of the first delignification zone and that no pump, no steam supply and no oxygen supply should be provided downstream of the reactor 28.

The addition of Kirschner's mixer 16 with a steam supply 18 upstream of the reactor 28 of the WO references is firstly not taught or suggested in the cited references and secondly creates an apparatus that is different from the apparatus claimed in the amended claim 10.

The WO 97/15715 or WO 98/23810 and Kirschner require extensive modifications that are not taught or suggested to satisfy the amended claim 10. Firstly, neither Kirschner nor any other cited reference teaches or suggests adding the first mixer 16 and the steam supply 18 to a place that is downstream of Kirschner's reactor 28. In contrast, the mixer 16 and the steam supply 18 are upstream of the reactor 28 and single mixers 24, 26 are disposed downstream of the reactors 28, 30.

The Examiner states that WO 97/15715 or WO 98/23810 teaches that steam can be added to the mixer 5 between the first and second delignification zones. This may be true, but none of the cited references teaches or suggests a steam supply attached to a mixer that is immediately downstream of the first delignification zone and so that the second pump is downstream of this mixer. In the cited WO references the mixer 5 is downstream (not upstream) of the second pump 4.

It is submitted that the references do not teach that they be combined in the manner suggested. Even if the

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references are combined all the limitations of the amended claim 10 are not satisfied. For example, none of the cited references teaches or suggests a second mixer immediately downstream of the first delignification zone that has a steam supply attached thereto and so that a second pump is disposed immediately downstream of the second mixer.

In view of the above, it is submitted that the amended claim 10 is allowable.

Claims 11-12, 14, 15, 17-22 are submitted to be allowable because they depend upon the allowable base claim 10 and because each claim includes limitations that are not taught or suggested in the cited references.

Claims 13 and 16 were rejected under Section 103 as being obvious over WO 97/15715 or WO 98/23810 in view of Kirschner (5,460,696) and further in view of W) 96/30586.

Claims 13 and 16 are submitted to be allowable because they depend upon the allowable base claim 10 and because each claim includes limitations that are not taught or suggested in the cited references.

The application is submitted to be in condition for allowance and such action is respectfully requested.

Respectfully submitted,

FASTH LAW OFFICES



Rolf Fasth  
Registration No. 36,999

FASTH LAW OFFICES  
629 E. Boca Raton  
Phoenix, AZ 85022

Telephone: 602-993-9099  
Facsimile: 602-942-8364

Cc: Hans Furhem, Kvaerner Pulping AB (Your ref: HFU/0004US/KN)